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The Scope for Reconciling Public Good and Private Forestry in the United Kingdom

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The nature of private forestry in the UK as an economic activity is changing, with increasing 'public good' demands being placed on forest owners, with or without compensation from government. Although the motives for owning woodland are weakly researched, it is evident that amenity and recreational interests rather than formal productive economic activity are a major force in influencing woodland purchase and may well be a dominant force in woodland management over many parts of the UK. Recent research suggests a need for recognition of the high value of the public goods and, in particular, recognition of their high levels of spatial variability, whilst recognising that the public good - private good dualism is an oversimplification of the actual situation. New policy instruments are currently being implemented in various parts of the UK by devolved governments, and their capacity to both remediate market failure and address the needs of forest owners is considered. Their voluntary character and the preferences of forest owners may seriously constrain the optimal delivery of public goods. Further, existing policy instruments may be seen as insufficiently geographically targeted to areas where the greatest social benefits could be anticipated from policy-induced improvements in public good values.

Keywords: spatial variability, private woodland, property rights, multifunctionality, joint products, positional good, halo effect

INTRODUCTION

The small-scale private forestry sector faces substantial difficulties in many parts of Europe. Although conditions vary between countries, the heart of the problem is that the small-scale private forest sector is frequently unprofitable without substantial public support. However, private woodlands are acknowledged as important providers of public goods, particularly those relating to landscape, informal recreation and biodiversity, but also including soil and water protection and avalanche prevention. The delivery of these public goods is supported by a range of fiscal, regulatory and economic instruments but, in many countries, it is doubtful whether these instruments are sufficient to maintain these resources in a

condition to ensure effective management from a public good and aggregate economic welfare perspective. This gap between public good value and private profitability has become an increasing obstacle to the effective overall management of the private woodland resource. Unless the public good elements can be either given value in the market place or appropriately supported by policy, a continued reduction in public good values seems inevitable.

The Forestry Commission owns or manages 35% of the UK forest area (Forestry Commission 2003). The largest proportion of the non-Forestry Commission woodland is in the hands of private owners (44% of all woodland and forest area) with business ownership accounting for 12.3%, municipalities and other public bodies 4.9% and NGOs 3.6%. Neither the Forestry Commission nor anyone else has a complete picture about the types of woodland owner or, indeed, the size of the ownership units on this 65% of UK woodland. The national inventory, which was last undertaken between 1995 and 1998, examined woodland type and woodland size, but not (except in a voluntary sample) woodland ownership. About 32% of all UK forest and woodland is in blocks of less than 100 ha (Table 1), of which only 2% is in Forestry Commission hands. Much of the private woodland is thus in small units that provide a major contribution to the landscape of the UK.

Table 1. Proportion of UK forest by size category of non-Forestry Commission owned woodland

Size category (ha)	Share of total UK forestry by land area (%)
< 10	11
10-20	6
21-50	9
51-100	7
101-500	16
500 +	16

Note: The residue is owned or leased by the Forestry Commission.

The private forestry estate is proportionately more broadleaved: only 37% is exclusively coniferous, compared to 75% of the Forestry Commission forest. It is much older than the Forestry Commission estate and, in many regions, no evident silvicultural management is being undertaken on most of this woodland. This lack of management may reduce biodiversity and informal recreational values, through closure of the forest canopy reducing biodiversity and through the growing over of footpaths and rides impeding access. A further characteristic of the private forest is that it tends to be located in the lowland parts of the UK, close to major concentrations of population. In contrast, the bulk of the Forestry Commission owned forest is in the more remote rural areas, although the Forestry Commission also owns some woodland close to large urban concentrations, for example in South Wales.

Private forests and woodlands of the UK are a heterogeneous group, comprising long-standing small woodlands of traditional landowners, new grant-aided farm woodlands and large blocks of upland afforestation. Many of the latter date from the 1970s and 1980s, when large tax concessions – which were particularly

advantageous for high-income earners – led to the fiscally assisted afforestation. These plantings – often in remote regions and almost exclusively composed of exotic conifers – were highly contentious, with strong opposition from environmental interests (Tomkins 1989). The extreme case of this type of activity was afforestation of deep peat soils in Caithness and Sutherland, where 20 years after the afforestation process, many areas of forest are now being felled to waste (or with minimal timber value derived) by environmental organisations in an effort to recover the quality of the damaged habitat (NDR Environmental Services 2002).

With a few notable exceptions, including the Caithness-Sutherland area and, to a lesser extent, the Southern Uplands of Scotland and parts of Argyll, private forestry is concentrated in the south and east of the UK. Here, the older private woodland and forest estate is associated with both high environmental values and high landscape values. In such areas, woodland is both sought as a private good and highly valued as a public good. This paper reviews the problem of the asymmetry of public and private benefit in the context of private woodland in the UK. Although the UK is possibly an extreme case of this asymmetry, it represents a growing trend in private forestry in Europe, in which financial returns to private forestry are low and public good values and externalities are growing in importance. This paper sets the issue within an economic theoretical framework, reviews the policy context, considers empirical evidence from recent research and suggests some possible policy solutions.

THE THEORETICAL CONTEXT

A number of elements of economic theory inform the examination of the public good - private good dualism in private forestry. Although property rights are often seen as fixities, social scientists have increasingly viewed property rights as socially constructed and mutable (Bromley 1991). Many of the public good characteristics of forestry arise as joint products. The rural land-use sector is a classic arena in which external effects arise. External effects and the special case of public goods are examined in this paper in a forestry context. The concept of a *positional good* has not been widely explored in a rural land-use context, although it can be argued that Hirsch's (1976) concept has relevance to contemporary rural land ownership and purchase. A further under-researched area of economics is the concept of the *halo effect*. As interest in the value of green infrastructure has grown, so it is incumbent on economists to measure the economic impacts of environmental features and the halo effect created by them. Each of these arguments is considered in the next section.

Property Rights and Forestry

Property rights can be seen as evolving social entities. Property rights might look like a concern of land law, rather than an issue for economists; however, some social scientists, including natural resource economists (e.g. Mehta *et al.* 1999) have argued that property rights are social products that arise from dispute and negotiation about value of forest products and services. Forestry is a suitable case for scrutiny of property rights, partly because rights have changed and partly because of the changing nature of forestry values to society as a whole. Hodge

(2000) noted the problems of defining property rights with respect to environmental components of land use. If the right is held by owners, they can legitimately both reduce the level of positive environmental outputs and pollute with impunity. If property rights are held by the State or society, the right to diminish the supply of environmental services can legitimately be challenged. The determination of property rights on the wider package of forest attributes also has profound consequences on the appropriate policy prescription.

Within the UK, the rights of owners of rural land are compromised in a variety of ways. In medieval times, as Rackham (2001) has described, there were numerous rights available under feudal tenure, which guaranteed villagers access to woodland for grazing, fuelwood and other products. These rights secured for local residents (rather than owners) rights to a range of products essential for livelihoods. With the passage of time, rights evolved and have been increasingly mediated by government. Game rights, for example, were enshrined in law at an early date, with specific rights clearly specified by the 15th century. The great struggle for access to Britain's open space and rural areas for recreational purposes was conducted in the 1920s and 1930s, with roots running back into the 19th century (Shoard 1999). The drive for access rights came from a combination of working class access movements and middle-class amenity societies. Limited linear (footpath) access demands were largely won in the *National Parks and Access to the Countryside Act* (1949), though subsequent legislation in the *Countryside and Rights of Way Act* (2000) (referred to as the CROW Act) has somewhat broadened the basis for access on mountain, moor, heath and down, with little effect on woodland owners.

The first mid-20th century shift in property rights was the clarification and affirmation of access rights in the National Parks and Access to the Countryside Act (1949) and subsequent legislation. Although there are some large areas of woodland that remain uncrossed by footpaths, many larger woodlands can be accessed on public rights of way. The fact that forest and woodland remained outside the CROW Act (2000) has meant that there has been no substantive change in property rights since the 1940s. However, it should be noted that in Scotland there have been substantial changes in property rights relating to rural land resulting from the *Land Reform Act* (2003). Not only does this Act create a Scottish system of access broadly akin to the allemensretten (everyman's right) of Scandinavia, but additionally it provides for communities to be supported in the right to buy land (with substantial public support), with the inclusion of powers of community purchase (subject to specific conditions) in crofting communities, even where a landowner has no desire to sell.

A second important mid-20th century shift of property rights took place through post-war planning policy. Although it may not seem at first sight to comprise a major shift of property right for landowners, the expropriation of development rights by *Town and Country Planning Act* (1947) and its associated betterment tax arrangements created an important dualism within the planning system (Curry and Owen 1996). On the one hand, even very modest activities relating to development by 'urban' land uses required the landowner to obtain planning permission, while on the other hand, large-scale changes in the appearance of land related to agriculture and forestry required no development control whatsoever. This interpretation of 'development' in UK planning law enabled the productive land uses of agriculture and forestry to make significant change to the appearance of land by such actions as

fencing, planting and drainage in ways that clearly constitute development under the terms of the 1947 Act, but which that same act (and subsequent modifications and amendments) permitted under the General Development Order. It is easy to see why a post-World War II context should have created these exemptions, given the wartime scarcity of food and timber, but by the 1970s questions were being asked as to whether the freedoms given for productive land uses remained appropriate. Such 'development' finally came under closer public scrutiny in some situations with the *Wildlife and Countryside Act* (1981), which created potential for compensation for opportunity forgone where designated wildlife sites were at risk from changing land-use practices, and yet still more scrutiny arose with adoption of the Environmental Assessment (Forestry) Regulations in the late 1980s.

In general, theorists argue that rights to a commodity or service tend to be clarified in law after the value of that commodity or service is articulated in the marketplace, with the law defining what the right comprises, except under rather specific conditions. Whereas rights to game were clarified centuries ago in the UK, rights relating to edible woodland fungi have only been partially clarified in the last few years, as their market value has rapidly increased.

There is substantial evidence that many of the contemporary values associated with forest and woodland are public or quasi-public goods and are not readily amenable to any relatively straightforward redefinition of property rights. For example, there is general consensus that biodiversity and landscape are valued highly by the general public, even though they do not present easy opportunities for commercial exploitation. The economic problems arising from this situation, essentially the gap between societal values and products with market prices, comprise the heart of the subject matter of this paper.

One of the more marked features of changing woodland ownership in the UK has been the substantial number of NGOs that have purchased woodland. Conservation Amenity and Recreation Trusts (CARTS) have been highly active in the UK in relation to woodland, especially the Woodland Trust, and to a lesser extent the County Wildlife Trusts, the National Trust and the John Muir Trust. These bodies are, in effect, internalising the externalities of woodland as club goods by creating collective ownership of the resource through acquisition by a trust or other body.

Joint Production in Rural Land Use

Joint products occur either when two distinct products arise from a single production system (e.g. wool and sheep meat) or when the production of one intended good results inadvertently in the production of another good or bad (Van Huylenbroek and Durand 2003). Whilst ecological economists tend to focus on the bads (Baumgärtner *et al.* 2001), using the laws of thermodynamics to expose the inadvertent production of waste, many rural economists have become aware of the importance of goods such as landscape, biodiversity and recreation access that arise under various rural land-use regimes (summarised in OECD 2001).

It is possible to argue that in general the monofunctional pursuit of a single financial output such as timber, usually associated with the intensification of the production system (in practice the replacement of semi-natural woodland with plantations) tends to lead to the diminution of non-market goods and an increase in non-market bads. In essence, the land-use system moves from the production

possibility frontier A to B in Figure 1, as a result of private decision-making to optimise the output of private goods. When the relative prices of the two components are considered alongside this technical production possibility curve, it is clear that the delivery of public goods is likely to be threatened.

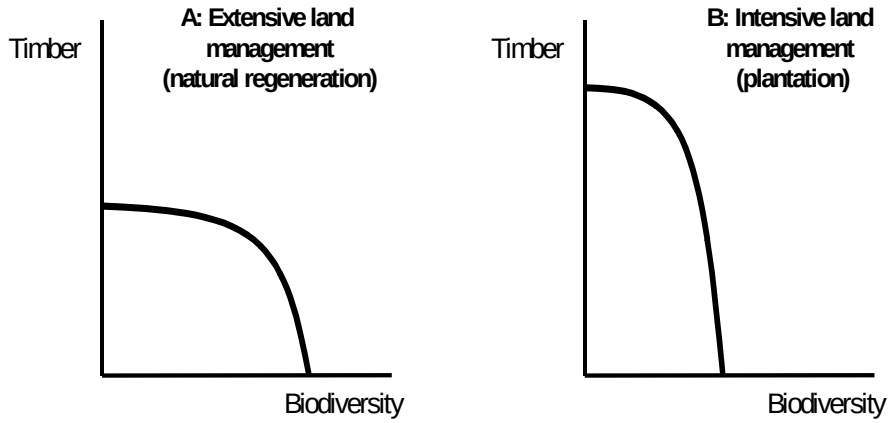

Figure 1. Joint production under extensive and intensive land management regimes

A critical question in the consideration of jointness in production or multifunctionality is whether, in terms of aggregate welfare, it is better to run a multifunctional forest with joint products or to divide a forest up into components which deliver different benefit streams in different parts of the forest (OECD 2001, p. 33).

External Effects and Rural Land Use

An externality can be said to occur 'whenever an individual's production or consumption decision directly affects the production or consumption of others, other than through market prices' (Begg *et al*. 1987). Externalities are endemic in relation to rural land-use systems.

As in the case of joint production, so with externalities a general relationship between the type of external effect and the intensity of land use can be hypothesised (Whitby and Ollerenshaw 1988). The resolution of the problem of external effects is normally achieved by means of the *polluter pays* principle or the *provider paid* principle. As Figure 2 illustrates, land-use systems at given levels of intensity simultaneously create both positive and negative external effects. There is, however, a general increase in negative externalities and a reduction in positive externalities as production intensity increases. For example, an intensively managed forest can provide some landscape and biodiversity value at the same time as generating road traffic congestion through logging activity or increased run-off and soil erosion.

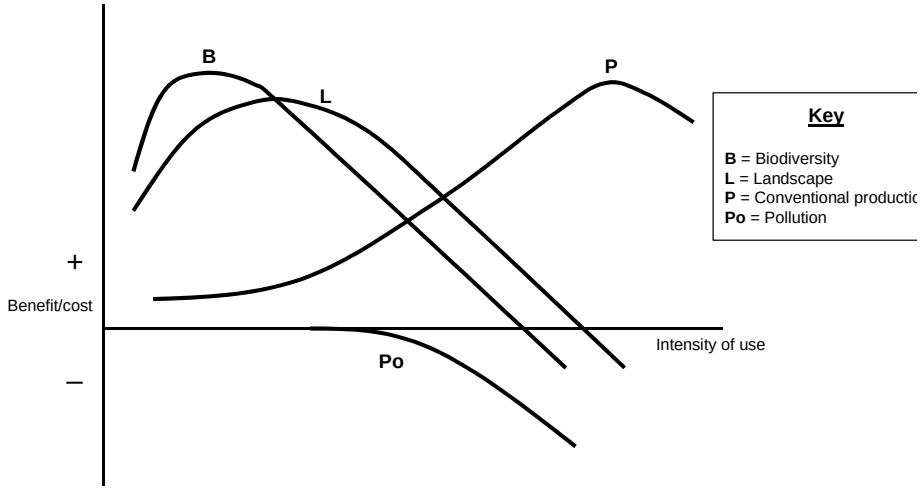

Figure 2. Intensity of use and external effects under land-use systems

Source: Adapted from Whitby and Ollerenshaw (1988).

Public Goods and Rural Land Use

A *public good* has been defined as 'a good that even if consumed by one person, can still be consumed by other people' (Begg *et al.* 1987). Public goods have two essential characteristics: non-rivalry in consumption and non-excludability. The non-excludability of public goods ensures that they will not be provided by the private sector in the absence of government-offered incentives.

In many cases, the full set of criteria for public goods may not be met in practice. Mantau *et al.* (2001) described the real-world situation as a continuum between fully excludable, fully rival private goods at one extreme and pure public goods at the other. The extent to which a good remains a public good depends on the distribution of property rights. If property rights change, so can the status of particular goods or services. For example, the affirmation through legislation of a public right of access to woodland in Scotland since 2003, turns what was not a public good into one, whereas in England there is a more limited right of linear access in some woodland on the basis of access legislation which took place earlier in England than that in Scotland. In Europe as a whole, there is a gradation of publicness in relation to woodland access, ranging from the allemensretten of Nordic countries to much more limited or even non-existent rights of public access in more southern European countries. Thus public goods can be seen as social constructions rather than eternally constant dispositions of property rights, and are subject to both spatial and temporal variation.

Positional Goods and Rural Land Use

The concept of a *positional good* derives from the work of Hirsch (1976). He argued that there are two types of good: material goods and positional goods. In an age of high mass consumption, people's material good needs are often satiable. However, their expenditure will be attracted to particular goods, for which there is absolute scarcity. Hirsch's examples include such goods as paintings by renowned artists. Ownership of these goods yields a warm glow as well as the kudos of ownership.

Prices for such positional goods may be particularly high and will be conditioned by a combination of demand and scarcity. However, positional goods will tend to be expropriated by those who are wealthy and will not necessarily be available as public goods. Rural land (especially in attractive areas to live) and attractive old buildings have acquired positional good status in many countries.

In many ways, the process of acquisition of positional goods is akin to what other social scientists have described as a process of commoditisation (Marsden *et al*. 1993). Rather than being freely available as a public good, nature can be packaged and turned into a commodity to be sold in the market place or consumed privately in privileged and privatised space from which others can be excluded. In its normal context, commoditisation is seen as a means to expropriate the value of the environment in pursuit of profit. In its positional good manifestation, the objective of commoditisation tends to be consumption rather than production.

Sanne (1997) argued that, rather than being socially negative in its repercussions as Hirsch had argued, the pursuit of positional goods could lead to a partial resolution of the adverse environmental impacts of the unconstrained pursuit of material goods. Environmental positional goods may be specific beneficiaries of the deflection of demand from high-resource consuming consumer goods, thereby contributing to a more sustainable form of development. Whether this happens through individual or club good purchase is immaterial. The key effect is to withdraw resources from high environmental impact production or consumption into environmentally beneficial expenditures.

Regional Impacts: the Halo Effect of Rural Land Use

The final theoretical contextual starting point for an analysis of private forestry is the *halo effect*. A halo effect arises where one economic activity (such as forestry) generates unintentional benefits by bestowing an economically beneficial shadow on nearby economic actors. These actors may be firms parasitizing the adjacent public goods or positive externalities, or households doing the same. The halo is a metaphor for the ring of benefits derived by adjacent economic actors around an attractant, such as an area of woodland. In such cases, rather than externalities comprising ‘abstract’ non-market returns to the resource, they are partially internalised by economic actors unconnected to the proprietal unit except by the proximity. The resource owner is rarely compensated and may even have to ‘suffer’ negative external effects on his resource, e.g. through unregulated access or dumping of refuse. In recent years, it has become evident that the economic effects of trees reside less in their timber values than in the wider economic repercussions on other economic actors. At one level, such an outcome can be dismissed as an external effect, occasionally internalisable, whether by private action (see Mantau 2001) or by policy change that redefines the property right. At another level though, it is evident that many of these internalisable benefits are acquired by economic actors other than the owner, and that there is likely to be a strong correlation between proximity to the resource and the extent of benefits derived by other economic actors.

Regardless of whether the benefit stream created by the existence of an environmental asset such as trees and woodland can be internalised, there should still be a measurable economic footprint arising from this spillover (external) effect. Slee *et al.* (2004) investigated the scale of this halo or shadow effect in two study

areas in south-eastern England and found it to be very large, at about 10 times the level of regional economic output arising from timber products.

THE POLICY CONTEXT FOR PRIVATE FORESTRY IN THE UK

From an economic perspective, policy might be rationalised by reference to efficiency or distributional consequences associated with the market for woodland and forestry-related products and services. In practice, the dominant driver of forest policy for most of the 20th century was a politically motivated need for a strategic reserve of timber. From the 1970s, a more rationalist market-failure perspective has been invoked (HM Treasury 1972, PIEDA 1986), but it still remains relatively weakly manifested in policy instruments. Further, many people would argue that rural policy is more a product of sectional interests engaging in rent-seeking behaviour (seeking conferment of benefit from the public purse, by lobbying and persuasion or other forms of public action), than any rationalist market-failure-correcting activity, in spite of government protestations to the contrary.

The UK policy framework with respect to both silvicultural and environmental aspects of forest and woodland, and of public access to them, has undergone substantial change in recent years. From its origins in the early 20th century, policy with respect to forestry has moved from a strong production orientation to a policy that endeavours to nurture multifunctionality. Whereas from the 1920s to the 1970s the aim was to encourage timber production, after 1980 the grant system for private forestry increasingly favoured amenity planting and broadleaf species. Further, policy in the forest sector is now heavily influenced by pan-European and, ultimately, global agreements. Forest policy has changed profoundly in the last 20 years, but these changes have taken place in spite of rather than because of forestry acts. Forestry has been more influenced by policies with respect to taxation, devolution, land reform (in Scotland) and access (in different ways throughout the UK) and, to a lesser extent, policy with respect to environmental regulation, than explicitly by forest policy.

The England Forestry Strategy (EFS) (1999) has four main areas of interest: forestry for rural development; forestry for provision of recreation (which merges imperceptibly with rural development, in that capture of tourists' and recreationists' income is one of the principal means of rural development); forestry for conservation and biodiversity protection; and forestry for (urban) regeneration. The post-devolution framework[1] rolls forward the strategy under an umbrella aim of sustainable forest management (Forestry Commission, England 2003). Scotland and Wales produced separate documents, which are attuned to the specific forest and woodland contexts in those countries, with the Scottish document more overtly concerned with the traditional production-based activities in the wood supply chain.

At a sub-national level in England, Regional Forestry Frameworks have been or are being developed for each region. The frameworks will help integrate woods and

[1] In the late 1990s, Scotland and Wales were granted a greater degree of self-government, with some areas of policy becoming devolved powers to the Scottish Parliament or Welsh Assembly. Forestry and agriculture were facets of policy in relation to which devolution of responsibility occurred, which allowed differences in policy to emerge in different parts of the United Kingdom.

forest policy into other regional policies, to identify priorities for spending by regional development agencies, to inform priorities for spending and to focus action and support (Forestry Commission 2004).

How might economic analysis as defined above inform policy in the forest sector? First, the clarification of property rights is necessary to know whether the policy-maker should be making the polluter pay (if the property right for the external effect resides with the State), or compensating the owner for delivering the environmental service (if the owner has the right to deliver or deny delivery of the service). Second, changes in property rights have particular economic consequences, which may not be immediately apparent. New policy measures can ease the pain of property right changes (for example, through compensation for loss of rights or introduction of codes of practice for walkers). The existence of a joint-product relationship informs policy, and the nature and degree of the relationship needs to be considered, alongside whether there is a market for the joint products. If one of the joint products is an externality, the private owner will need to be given incentives to provide it; indeed, a monofunctional action by the private owner who is making silvicultural system change to increase production outputs can often be seen to reduce the level of multifunctional benefits by altering the production possibility relationship. Determining the extent to which the non-timber benefits of multifunctional forestry are pure or partial public goods thus informs the decision as to whether compensation is required for opportunity forgone or whether landowners can be induced to internalise the externality. The positional good argument poses a greater policy challenge: 'Is it necessary to support financially through policy means the delivery of landscape and other environmental services when affluent private woodland owners will continue to run woodlands at a loss as a hobby activity for their personal utility?' The last economic concept, the halo effect, explains how forestry affects local economies. There are two main policy implications: first, that green infrastructure may be a valuable public investment to stimulate local economic activity; second, that the beneficiaries might be thought of as potential contributors to that green infrastructure through hypothecated[2] local taxes.

THE EVIDENCE BASE CONCERNING THE VALUES ASSOCIATED WITH PRIVATE FORESTRY

This section explores some important contributions from the academic and grey literature to the evidence base regarding the contemporary economic value created by private forestry. It first examines the estimation of non-market benefits in forestry, including consideration of the spatial distribution of benefit. The market for forest and woodland as a positional good is then explored, followed by an examination of the wider ramifications of forestry on economic activity in regional and sub-regional economies.

[2] A hypothecated tax is one for which the receipts are used for a specific task, as when fuel taxes are dedicated to improve public transport rather than lumped into consolidated public revenue. The hypothecation relates to the specified use of a tax, rather than the tax being pooled into government funds for whatever type of spending government chooses.

Non-market Benefits and Forestry

The estimation of non-market benefits of forestry has been an object of attention of economists for almost 50 years, e.g. see Trice and Wood (1958) and Davis (1963). Two main groups of methods have been used to elicit these non-market values (Bateman and Turner 1993). Revealed preference approaches are based on actual evidence of visitor behaviour and can thus only be used to estimate use values. Stated preference approaches, based principally but not exclusively on contingent valuation and more recently on choice modelling, allow the evaluation of both use and non–use values.

Recent UK work (Willis *et al*. 2003) indicates an annual value of the non-market benefits of forestry in the UK of over £1 billion, with informal recreation the largest component of this, biodiversity the second most important element, and the attractiveness of forestry in the landscape the third most important (Table 2).

Table 2. Annual value of non-market benefits from forestry in Great Britain

Environmental benefit	Annual value (£ M)
Recreation	393
Landscape	150
Biodiversity	386
Carbon sequestration	93
Air pollution absorption	0.4
Total	1023

Source: Willis *et al*. (2003).

The first work conducted in the UK on non-market values and recreation was that of Mutch (1968), using a simplified travel cost approach at a number of forest recreation sites. Subsequent studies of the value of informal recreation in UK forests (e.g. Grayson *et al*. 1973, Hanley and Ruffell 1993) have focused on State rather than private forestry. Willis (1991) provided useful evidence of the spatial variations in benefit (see Table 3) which, although taken from a travel cost study around 1990, probably still broadly reflect the spatial variability of values of non-market benefits of recreation in the UK.

Table 3. Estimated values of informal recreation in various UK forest areas

Forest location	Value (£/ha/year)
Cheshire	445
New Forest	425
Forest of Dean	245
Brecon	42
Thetford	14
Newton Stewart	4
Lorne (Argyll)	2

Source: Willis (1991).

In recent years, there have been substantial efforts to build *benefit transfer* models that apply to all woodland in the UK, including both semi-natural and planted forests (Brainard *et al*. 1999, Brainard *et al*. 2001), and Rosenberger and Loomis (2001) have undertaken a comprehensive review of benefit transfer in the context of US forests. These approaches would allow a number of sites to be sampled and, through the application of attribute-dependent valuation, enable the prediction of values at other sites on the basis of their attribute set. These approaches have replaced the somewhat looser approximations found widely in US textbooks that indicate the average consumer surplus per user day under different activities (e.g. Walsh 1986).

Recent work of the Woodland Trust (2004) explores the scope for GIS to delineate woodland access opportunity. The study points out that the existence of permission on a right of way in England or Wales or as area access in Scotland may not be a sufficient reason for classifying woodland as a recreational asset; there needs to be, in addition, a clear invitation through rights of way signing or encouragement of access. The Trust goes on to propose a Woodland Access Standard, arguing that accessible woodland is a something that should be made publicly available. The proposed woodland access standard is an NGO aspirational approach to providing greater public access opportunities to private woodland. It also provides a clear basis for targeting particular types of woodland grant. The study concludes that there is a need for 'wider public debate on current mechanisms and a case for stronger mechanisms to substantially increase access to privately owned woodland' (Woodland Trust 2004, p. 23).

In summary, knowledge has now advanced to a state where it ought soon to be possible to predict with reasonable accuracy the non-market economic values associated with forest and woodland. Clearly, there may be woodlands with particular relationships to particular places, which command higher values arising from attributes that a general modelling exercise cannot pick up. However, as a first step in establishing 'ballpark' valuations and variations in value, benefit transfer has much to recommend it. Combined with earlier approaches, what these studies reveal is enormous variations in value depending on location and other woodland characteristics.

Positional Good Characteristics of Forestry and Woodland

The positional good character of woodland is evident in the prices paid by new woodland owners for woodland assets with virtually no income-generating possibilities. The Financial Times (2004) reported prices being paid for woodland in south-east England which were entirely contingent on the intrinsic values rather than the marketable products derived from active silvicultural management. The article noted a distinct gradient of value conditioned more by demand for the positional good than the timber production potential of the resource.

Those who wish to own woodland as a positional good often do not wish to own (or perhaps cannot afford) large areas of woodland. Although there is likely to be a minimum size, the desired size of woodland purchases appears to be typically between two and 10 ha. Ancient semi-natural woodland is likely to be preferred over more silviculturally productive land. Thus the positional good value of woodland will depend on the type of woodland, its size and its location with respect to demand.

The Wider Ramifications of Forestry on Economic Activity

The wider ramifications of forestry can be explored through regional economic analyses, especially those which are based on the appraisal of money flows within regional economies arising as a result of forest-related spending. There are two central concepts: linkage and leakage. Where an economic activity is strongly connected to other local firms, there are necessarily strong local linkages. Where more distant markets are supplied or used to source inputs, local leakages are much weaker. Strong linkages ensure that when there is an injection of funding into one sector (say woodland owners) there will be knock-on effects to linked sectors. Leakage arises when inputs are sourced from outside the region or product passes out of the region in an unprocessed form.

A number of such studies were conducted in relation to forestry in the late 1990s (e.g. Munday and Roberts 2001, Eiser and Roberts 2002). Using such regional-based multiplier approaches, it is possible to compare traditional production forestry with new consumption-related uses or to compare alternative types of forestry such as farm forestry and mainstream large-scale forestry, or broadleaves and conifers. It is evident that the regional impact of production forestry in the UK is modest. This reflects the general decline in the importance of primary production and associated economic activities in the UK and elsewhere in the developed world.

The wider impacts of forestry in the UK may be much greater than the production-related impacts. The most widely cited and possibly exceptional case is of Coed-y-Brenin's mountain bike trails, which are reputed to generate between £2.5 and £4 M of tourist spending annually in the county of Gwynnedd in North Wales where the trails are located. More detailed work undertaken in mid-Bedfordshire and Breckland in southern and eastern England respectively (Slee *et al.* 2004) on the impact of forestry on regional economies bears out the importance of what can be termed the halo effect of forestry. Their study found that about 90% of the impact of forestry on regional economic output was achieved through non-forest-owning firms and households, principally tourism and recreational businesses, as well as the affluent households that value the residential living space created in tree-rich areas.

SOME POTENTIAL SOLUTIONS

Three economic facts stand out from the forgoing evidence. First, the non-market environmental values vastly exceed the timber values over much of the UK. Second, aspiring positional good owners are prepared to pay large amounts for woodland. Third, in many areas the presence of trees and woodland creates a halo effect of substantial value. The different economic facts point to different policy solutions.

The high levels of non-market values point towards a need to explore the scope for internalising the externalities or 'cultivating the amenities' in the words of the OECD (1999). Where there is scope for internalising the externality, it does not seem reasonable to call on the public purse to deliver what the market can already deliver. However, as Mantau *et al.* (2001) have pointed out, the capacity to create income is contingent on the direct or indirect capture of value, which is often conditioned by the disposition of property rights. As Slee *et al.* (2004) showed, much of the value of forests and woodlands is in fact captured by surrounding households and firms. These are often the principal beneficiaries and, rather than the

general public paying for the environmental assets through general taxation, a more local form of tax of beneficiaries is likely to be a more equitable solution. If this tax were hypothecated (allocated specifically to the enhancement of the environmental attributes of the forest), then local beneficiaries would be able to see the benefit of their financial injection, whether as home-owners through property value appreciation or as businesses through increased turnover.

Where the public-good service functions of private forests and woodlands cannot be internalised, there is a *prima facie* case for public support (subsidy) as long as the property right can be incontrovertibly connected to the owner rather than the State. The level of subsidy should be set as a minimum, at the cost of sustaining that public good or, in the unlikely event that the state were more generous, at the imputed market rent attributable to that service, were it possible to turn it into a market commodity.

An intermediate policy stance of cross-compliance could be developed, which parallels that in agriculture where receipt of public support is contingent on meeting base-level environmental standards. However, the cross-compliance approach can only be invoked where the State is subsiding some element of the forestry. The exact form of State support is immaterial: it may be grant aid or fiscal relief measures. What is essential to ensure the delivery of the public good is the 'leverage' that withholding such public payments might make on public provision of non-timber goods and services.

The positional good scenario raises the prospect of an alternative solution, which is much more non-interventionist. It implies that private woodland will often be acquired for its social or positional value, rather than its income-generating capacity, through the market mechanism. The environmental values appreciated by the purchaser are likely to be the environmental values appreciated by the general public. Consequently, the general public can effectively 'free-ride' the socially or positionally driven purchase by the private owner.

The private woodland owner may not manage the woodland in a way that maximises the non-market values. Whilst this could be achieved through opening up access, the private woodland owner might seek exclusive use of his woodland. Because of the predilection of many private woodland owners for sporting shooting (especially pheasants), wildlife conservation and biodiversity may not be core concerns of the typical new owner. Consequently, the mismatch between private and public amenity benefits may need to be reconciled through new policy means.

Conservation, Amenity and Recreation Trusts (CARTs) comprise an alternative type of woodland owner to private or public ownership, with the power to bridge the gap between individualistic and collective values (Dwyer and Hodge 1996). CARTs often have the funds to purchase woodland and they are often particularly concerned with the environmental qualities. The result is likely to be a split in woodland management styles between privately-owned woodlands and CART-owned woodlands. The former will be managed for the particular interests of the owner, which may well preclude public access and may treat the woodland as a game resource. The CART may manage the woodland with the aspirations and interests of the collective owners, and the woodland is likely to be managed with the environmental values to the fore. This may result in a set of woodlands which are monofunctionally managed to a greater extent than if the wider public aspirations

were embodied in all management practices, but the gap between public and private benefit may in practice be more modest than is normally supposed.

CONCLUDING COMMENTS

Private woodland and forest historically provided for local people through the provision of a range of wood and non-wood goods and services. Although there was a strong push to monofunctional forestry in the public sector in the UK after 1919, in order to create a strategic reserve of timber, private sector owners largely continued their multifunctional but private use of forests. Since the 1980s, state forests have become much more multifunctional resources, delivering a range of public good functions to the wider public at the same time as contributing to timber production. At the same time, most private woodland has been managed with a silviculturally light touch, if at all, with the exception of woodland for game management in some areas. Over large areas of lowland Britain, well under 10% of the mean annual increment of timber is currently being felled. Much private woodland is senescent, declining in biodiversity values and timber values and not always well suited for public access in its present state. Private woodland which is close to centres of population and highly suited for public good delivery is providing suboptimal levels of public benefit, largely because there are insufficient funds and inadequate policy means to effect a rehabilitation of these woodlands to match the complex societal demands of the 21st century.

Policy makers have recognised the multifunctional values, but have yet to comprehend fully the nature of the economic problem they confront. In the UK, private woodlands are frequently better placed to deliver multifunctional public good benefits than public forests. The privately owned woodland has – through virtue of its location – higher biodiversity and informal recreational ‘use values’, but such use is frequently compromised by a lack of accessibility to the general public and a lack of willingness of woodland owners to deliver these public goods without financial incentive. Greater economic literacy would inform the review of the policy problem and provide a focus for where policy means are needed and where market forces could be allowed to work. There are good economic reasons why unfettered markets will fail to deliver optimal solutions in relation to the demands for public good provision. The enhanced delivery of public goods from private woodland will continue to be compromised unless new and more appropriate policy means are created.

The limited funds to support private woodland delivery of public goods necessitate a more sophisticated spatial understanding of the potential for public good enhancement, if public funds are to be used to optimise public good benefit levels. At a time when compulsion in public good delivery has been eschewed in favour of a voluntary approach, it is also essential to understand the aspirations and interests of private forest owners, who may or may not be willing to engage with new policy instruments to increase public good delivery. It is also essential to design these policy instruments to be compatible with their interests and concerns.

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